



The Dean's Newsletter



From
College of Pharmacy Dean
Gary Pollack, Ph.D.

August 2015

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Dear Friends and Colleagues:

An important element of the mission of our college is the development of outstanding health care professionals and pharmaceutical scientists. Implicit in this mission statement is the preparation of our students to seek out, accept, and succeed in positions of leadership throughout their careers.

One strategy we use to assist in the preparation of future leaders is to offer a menu of academic options that allow students to tailor their experiences to their individual career goals and interests. During the past few years we have introduced an honors program that allows selected students to pursue a research project and develop skills associated with basic, translational, or clinical research; a combined Pharm.D./Ph.D. program that provides an efficient pathway to success for students who wish to pursue a career in academia, the pharmaceutical industry, or federal regulatory agencies; and a combined Pharm.D./MBA program to support the goals of students who wish to start or own their own business or aspire to leadership positions in healthcare systems or the corporate sector.

In addition to these program-level pathways, we have developed a number of options that are smaller in scope but reach a larger number of students. An excellent example of these efforts is our "Preparing for Your Career in Pharmacy" seminar series. This series allows students to interact with such distinguished individuals as Tom Menighan, CEO of the American Pharmacists Association; Dan Buffington, Pharm.D., MBA, and owner of Clinical Pharmacology Services; Steve Anderson, CEO of the National Association of Chain Drug Stores; and Congresswoman Cathy McMorris Rodgers, who has introduced legislation in Congress addressing the continuing need for new approaches to treating disease. These visits expose our students to contemporary thinking on a wide range of issues related to pharmacy, model leadership behavior, and allow students to network early in their careers with leaders from a variety of sectors related to health care.

As we implement the extension of our Doctor of Pharmacy program to the Pacific Northwest University of Health Sciences campus in Yakima this year, we will continue to evaluate programmatic options and

partnerships to support the aspirations of our students in both locations. We remain committed to increasing access to the highest-quality pharmacy education available, and to preparing our students for impactful careers regardless of the specific path they choose.

Best wishes,



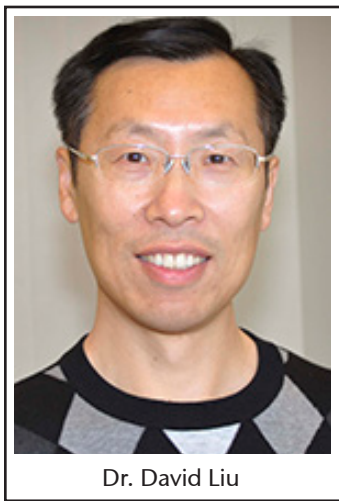
Gary M. Pollack
Dean
Washington State University College of Pharmacy

Pharmacy researchers discover protein pulling double duty

Multitasking protein guides transcription, gives structure

Pharmaceutical sciences researchers at Washington State University have discovered a protein's previously-unknown role in cell division.

The protein itself is well known, as is its presence within the human cell. It is known as ATF5, or Activating Transcription Factor 5, and it controls how often specific genes are expressed, or in other words, copied from DNA. ATF5 regulates genes that control cell survival.



Dr. David Liu

The kicker is this: the research team identified a role this protein is playing that is not related to being a transcription factor. They discovered that within the part of the cell called the centrosome, ATF5 is also acting as a structural protein.

Structural proteins perform much like their name suggests, they maintain cell shape and make up connective tissues like cartilage and bone.

Under previous scientific understanding, telling a scientist that a transcription factor was doubling as a structural protein would be like telling your neighbor you are building a backyard shop and planning on making the structure's foundation out of pudding. The scientist—and your neighbor—wouldn't believe you. It's never been seen before.

"This is an eye opener for people working in the field," said David Liu, the lead member of the research team. Their findings provide the first evidence of this kind, and they don't stop kicking there.

David Liu, Ph.D., is an associate professor at the Washington State University College of Pharmacy and a corresponding author on the research article published in the July 30 issue of Cell Magazine, [also available online](#). Their discovery provides the first evidence of the structural interactions within the centrosome and the role of ATF5, which they discovered was "very strategically located within the centrosome, and playing a

totally different role than we previously understood,” said Liu. “We also discovered the interaction is a charged molecule.”

The centrosome is the cell component that is vital to successful cell division and duplication, which is a process that effects a wide spectrum of larger processes from healing, to cancer growth, to fighting off disease.

A CAMPAIGN TO DISPROVE BECOMES DISCOVERY

Liu has been studying ATF5 for some time. In a previous research study, he tagged the ATF5 protein with green dye, a fluorescent protein produced by jelly fish, and discovered its presence in an area of the cell that didn't seem to make sense. He wanted to show the presence of ATF5 outside its “normal place” was irrelevant, so he could get back to studying what he was originally focused on: ATF5's role as a transcription factor.

“After finding this, I wanted to disprove it. But the more we worked on it, the more it was apparent it had real purpose,” said Liu. “Ultimately, it became a big discovery.”

Liu and his team tried to dive deeper into the centrosome to find answers, but it wasn't as straightforward as zooming in with a microscope. The centrosome is difficult to study. It is just one of many organelles within the human cell, but it is the only one without a membrane.

“Size is also a big factor,” said Liu. The centrosome is only as long as one-half the length of a light wave. This means it is impossible to focus a microscope on it because microscopes use light to magnify. At best, the image you get is a fuzzy blob. “Like a shadow on an X-ray,” he said.

To overcome this, the research team developed a new technique to study what is too small to see under a microscope. Their process used Nano-gold particles to “label” the target particles, then they surrounded that with silver enhancement in order to see it with the electron microscope. This new technique makes a picture of something too small to see previously. It turns the X-ray Liu mentioned into something more high-resolution.

OPENING THE DOOR TO FUTURE UNDERSTANDING

The centrosome is made up of two perpendicular parts called centrioles, and this pair regulates DNA separation and replication within the process of cell division, said Liu.

“Failure of centrosome duplication can result in malformation of mitotic spindles, causing a variety of genomic instabilities,” said Liu. Malformed cells with genomic instability contribute to tumor development and a variety of conditions, such as dwarfism, ciliopathy, microcephaly, and other conditions that effect cilia movement, said Liu.

Cell cilia are important to cell movement within the body. They work like antenna, and communicate with the rest of the cell to move it toward nutrients, but knowledge is very limited on how it works, said Liu. This discovery is a missing puzzle piece that could help connect a lot dots. Liu is hoping this research will ultimately lead to an understanding of cell survival.

“Cell survival is very fundamental and affects all of our cells with broad implication across many types of disease. Knowing how to correct a defect we have the hope to treat disease,” said Liu.

Liu and five pharmaceutical sciences colleagues at the WSU Health Sciences campus in Spokane teamed up with scientists from Penn State, the Chinese Academy of Sciences, Zhejiang Sci-Tech Univeristy, and the University of Texas to complete the study that was funded in part by the American Cancer Society and the U.S. Department of Defense. Types of cells studied include ovary and breast cancer cells, and glioma (brain tumor) cells.

Liu is from Qingdao, a city on the coast of China. He has a doctorate in molecular genetics from City University of New York and he came to WSU in July of 2013 from the Penn State College of Medicine. He plans to continue to study ATF5 and its role in gene transcription, DNA splicing, protein-to-protein interaction and response to stress.



Dr. Danial Baker

Pharmacy professor joins national drug expert committee



Dr. Danial Baker

Danial Baker, Pharm.D., was appointed to a five-year term on the U.S. Pharmacopeial Convention’s [Healthcare Quality Expert Committee](#). He began his term last month and attended his first committee meeting from July 20-21 in Rockville, Maryland.

“This opportunity makes it possible to make formulary recommendations that effect all patients covered by Medicare and help advance the quality of care for all of the citizens of the United States,” said Baker. “These same principles can then be shared with our student pharmacists at WSU, so they can better understand formulary systems and provide the best quality care for their patients.”

The U.S. Pharmacopeial Convention (USP) is the organization that has been responsible for ensuring the quality of America’s drug supply since 1820. The USP sets the standards that regulate the strength, quality and purity of medicines, food ingredients and dietary supplements manufactured and sold worldwide in more than 140 countries. Within the United States, these standards are enforced by the Food and Drug Administration.

Baker has over 20 years of experience serving on various pharmacy and therapeutics committees involved in making decisions for populations of patients—ranging from thousands to millions of individuals—at the regional, state and national level. Last October, Baker was appointed to the [U.S. Food and Drug Administration’s Arthritis Advisory Committee](#). At the USP, he will be contributing to the development of programs and guidelines that impact the citizens of the United States and the world, he said.

Baker is an [associate dean and professor](#) at the WSU College of Pharmacy. He also serves as the director of the WSU Drug Information Center in Spokane, Washington. He has been a faculty member at WSU for 32 years.

He has been a member of the USP since 1987, and has served in the past as a consultant to the Healthcare Quality Expert Committee on several occasions, said Baker.

“While at the 2015 USP Convention I was asked by a colleague why I wasn’t a member of the expert committee, so I submitted my application once the convention was over,” he said.

On the expert committee, he will be one of 25 health care experts, including government liaisons, from across the nation. Their function is to create and/or revise the health care quality standards that support the U.S. National Quality Strategy, continuously revise the USP Medicare Model Guidelines, and address other current public health needs.

The National Quality Strategy, established as part of the Affordable Care Act, is a report to Congress first published in 2011 through the U.S. Department of Health and Human Services. It serves as a set of guidelines for measuring health care quality and quality improvement efforts nationwide and supports the ACA’s goal to provide better, more affordable health care for all Americans.



Advancing innovation, excellence on both sides of academia

Pharmacy researcher studies teaching and learning methods



Dr. Connie Remsberg teaches pharmaceuticals and compounding to first-year student pharmacists.

The millennial and Z generations are breaking a lot of social and societal molds, including how they view academia and approach advancing their education. The methods they use to communicate and interact are different, and how they view the world they live in is different, than any generation that precedes them.

So how do institutions of higher education address these changing demands and deliver a better education? Connie Remsberg, Pharm.D., Ph.D., is trying to define a solution. She recently received \$7,000 from Washington State University to help with the process.

The Samuel H. and Patricia W. Smith Teaching and Learning Endowment provides funding to WSU faculty to pursue innovative ideas and enhance learning and teaching at WSU. The fund was established by alumni and friends at the time of WSU President Smith’s retirement in 2000. Grants awarded from the endowment align with Smith’s passion of creating new ways to educate students. This year, seven WSU faculty received grants, including Remsberg. Each award provides the recipient with \$7,000.

Remsberg is a clinical assistant professor and the director for the advancement of teaching and learning excellence at the WSU College of Pharmacy. What this means is Remsberg has been designated as the go-to resource for faculty transitioning to new competency-based active-learning model that is being implemented this year as a result of the college’s extension of its Doctor of Pharmacy program in Yakima, Washington.

The program's extension has presented a challenge to the college, namely, the coordination required between the college's main location in Spokane and the extension in Yakima. Ensuring consistency with material and content delivery is one of the biggest hurdles the college had to overcome, and is one of the reasons for Remsberg submitting a proposal for the grant.

"We need to ensure we are developing materials that are engaging and are at the appropriate level," said Remsberg. "Yakima is going to be a catalyst—and an opportunity—to address how we can deliver a better education to our students."

The first cohort of WSU student pharmacists in Yakima will begin the professional program this August.

The grant will contribute to gathering formal data to address a few questions, said Remsberg. "Right now we are asking: How do we get the faculty actively prepared? What are the best methods? And, how do we best to communicate our 'lessons learned' to the greater WSU community/campuses?"

The College of Pharmacy began the process of improving teaching and learning within their Doctor of Pharmacy curriculum in order to provide a better education for its students, following the college's strategic mission to develop outstanding health care professionals and scientists, and to improve human health through excellence in collaborative research and scholarship. Remsberg and her faculty colleagues are expecting that with each year, the transition to the new grading and teaching models will get easier.

"This is just one example of how we are striving to help our faculty to be the best educators possible," said Remsberg. △

Student pharmacist selected as national scholar

WSU faculty–student duo join AACP Walmart Scholars Program



Ryan Nottingham,
class of 2016

Student pharmacist Ryan Nottingham intends to work with geriatric patients as part of an ambulatory health care team after graduating next year. To learn more about pharmacy education, she applied for—and won—one of 85 national travel scholarships to attend the meeting of the American Association of Colleges of Pharmacy in July.

"Working directly with the people I educate, whether they be patients or students, is my top priority in my future career," said Nottingham, a Bainbridge Island, Washington, native who will be based in Olympia, Washington, this year to complete six pharmacy practice rotations for her Doctor of Pharmacy degree.

WSU pharmacy faculty member Jennifer Robinson was chosen with Nottingham for the 2015 AACP Walmart Scholars Program. It provides \$1,000 to student-faculty pairs to attend the national meeting and teacher seminar, which will be in National Harbor, Maryland.

“The scholarship will give me an opportunity to explore academic pharmacy from a position of an educator, rather than as simply a student,” said Nottingham. “I am looking forward to learning from some of the top educators in the world of pharmacy.”

“Ryan is an exceptional student pharmacist who has the ability to fit in any career path she chooses,” said Robinson, who is also director of student services for the WSU College of Pharmacy. “She has the building blocks needed to be a successful clinical pharmacist and educator.”



Other College News

FACULTY SCHOLARSHIP

Publications

- Pharmacotherapy Professor **Tracy L. Skaer** and two co-authors published, “State of Washington opioid prescription guidelines for the management of chronic non-cancer pain,” in The Journal of Pain (2015;16(4):S86).
- Pharmacotherapy Clinical Professor **Terri L. Levien**, Pharmacotherapy Professor and Associate Dean for External Professional and Continuing Education **Danial E. Baker** and two co-authors published the formulary drug review, “Ombitasvir/Paritaprevir/Ritonavir and Dasabuvir,” in the May 2015 issue of the independent, peer-reviewed journal Hospital Pharmacy (50(5):396-412. DOI:10.1310/hpj5005-396). [read more](#)
- Boeing Distinguished Professor and Pharmaceutical Sciences Chair **Philip Lazarus** and 11 co-authors published, “Cannabis smoking and lung cancer risk: pooled analysis in the International Lung Cancer Consortium,” in the February issue of the International Journal of Cancer (2015; 136(4):894-903). [read abstract](#)
- **Philip Lazarus** was a co-author with 63 others on the article, “Risk factors for head and neck cancer in young adults: A pooled analysis in the INHANCE consortium,” published in the February issue of the International Journal of Epidemiology (2015; 44(1):169-85). [read abstract](#)
- **Philip Lazarus** and 11 co-authors published, “The effects of E-cigarette exposure on systemic cotinine levels and postnatal lung growth in neonatal mice,” in the journal PlosOne, a peer-reviewed, open-access resource from the Public Library of Science, on February 23, 2015 (10(2):e0118344). [read abstract](#)
- **Philip Lazarus** was a co-author with 73 others on the article, “Estimating and explaining the effect of education and income on head and neck cancer risk: INHANCE consortium pooled analysis of 31 case-control studies from 27 countries,” published in March in the peer-reviewed medical journal International Journal of Cancer (2015; 136(5):1125-39). [read abstract](#)
- **Philip Lazarus** was a co-author with 55 others on the article, “CHRNA5 risk variant predicts delayed smoking cessation and earlier lung cancer diagnosis—a meta-analysis,” published in the Journal of the National Cancer Institute, a peer-reviewed cancer research and treatment focused publication from the Oxford University Press [2015 Apr 14;107(5)]. [read abstract](#)
- Pharmaceutical Sciences Postdoctoral Research Associate **Sadiq Umar**, Pharmaceutical Sciences Research Associate **Anil K. Singh**, Pharmaceutical Sciences Associate Professor **Salah-uddin Ahmed**, and two co-authors published, “Thymoquinone inhibits TNF- α -induced inflammation and cell adhesion in rheumatoid

arthritis synovial fibroblasts by ASK1 regulation,” in the June 2015 issue of the journal Toxicology and Applied Pharmacology. [read article](#)

- **Philip Lazarus** and six co-authors published, “NNK reduction pathway gene polymorphisms and risk of lung cancer,” in June issue of the journal Molecular Carcinogenesis. [read abstract](#)
- Pharmaceutical Sciences Professor Emeritus **Gary G. Meadows**, Pharmaceutical Sciences Associate Professor **Hui Zhang** and two co-authors published, “Chronic alcohol consumption inhibits melanoma growth but decreases the survival of mice immunized with tumor cell lysate and boosted with a-galactosylceramide,” in the June 25 issue of the journal International Immunopharmacology (28(1): 359-368). [read abstract](#)
- Pharmaceutical Sciences Associate Professor **Grant Trobridge** and eight co-authors published, “VISA - Vector Integration Site Analysis server: a web-based server to rapidly identify retroviral integration sites from next-generation sequencing,” in the peer-reviewed online journal BMC Bioinformatics (2015 Jul 7;16:212).
- **Salah-uddin Ahmed** and one co-author published, “Nanomedicine in the ROS-mediated pathophysiology: applications and clinical advances,” in the journal Nanomedicine, a peer-reviewed journal covering nanotechnology, biology and medicine. [article in press]
- **Philip Lazarus** was a corresponding author with co-authors Pharmaceutical Sciences Postdoctoral Research Associate **Joseph H. Ashmore** and four others on the article, “No association between vitamin D intake, VDR polymorphisms, and colorectal cancer in a population-based case-control study,” published in the journal Cancer, Epidemiology, Biomarkers & Prevention. [read abstract](#) [article in press]
- **Philip Lazarus** was a corresponding author with one other on the article, “MicroRNA regulation of the major drug-metabolizing enzymes and related transcription factors,” published in the academic journal Drug Metabolism Reviews, the official journal for the International Society for the Study of Xenobiotics. [article in press]

Presentations

- **Tracy Skaer** presented, “State of Washington opioid prescription guidelines for the management of chronic non-cancer pain,” at the 34th Annual Scientific Meeting of the American Pain Society in Palm Springs, California, on May 14, 2015.
- **Salah-uddin Ahmed** presented, “Regulation of ASK-1 expression by microRNA-17 and its correlation with rheumatoid arthritis pathogenesis,” at the Annual European Congress of Rheumatology 2015 in Rome, Italy, on June 11, 2015. Pharmaceutical Sciences Research Associate **Nahid Akhtar** was the primary co-author.
- **Grant Trobridge** presented, “Identifying prostate cancer biomarkers using viral vectors,” at the Life Science Innovation Northwest conference in Seattle, Wash., June 30-July 1, 2015.
- **Hui Zhang** presented, “Chronic alcohol consumption on tumor progression: from inhibition to promotion via the modulation of immune function,” at the 38th Annual Research Society on Alcoholism Scientific Meeting in San Antonio, Texas, on June 24, 2015.
- U.S. Transuranium and Uranium Registries (USTUR) Research Associate **Maia Avtandilashvili** presented, “Modeling uranium hexafluoride inhalation,” at the Health Physics Society Meeting in Indianapolis, Ind., July 12-16, 2015.
- USTUR Research Associate **George Tabatadze** presented, “Radionuclide distribution measurement within anatomical bone structures using digital autoradiography,” at the Health Physics Society Meeting in Indianapolis, Ind., July 12-16, 2015.
- USTUR Associate Research Professor **Sergei Tolmachev** and **George Tabatadze** were contributing authors on the presentation, “Quantitative single-particle digital autoradiography with the ionizing-radiation

quantum imaging detector,” delivered at the Health Physics Society Meeting in Indianapolis, Ind., July 12-16, 2015.

- **Joseph Ashmore** presented at the annual American Association for Cancer Research meeting in Philadelphia, Pa., in April 2015.
- **Philip Lazarus** presented the seminar, “Characterization and regulation of tobacco carcinogen and nicotine metabolism pathways: potential for smoking cessation drug targeting,” at the University of Kentucky Markey Cancer Center in April 2015.
- **Philip Lazarus** presented the seminar, “Tobacco carcinogenesis: characterization of metabolism pathways and their regulation,” at the Washington State University College of Engineering’s Department of Chemical Engineering and Bioengineering in March 2015.

Service

- **Salah-uddin Ahmed** served as an expert reviewer for the Arthritis, Connective Tissue and Skin (ACTS) study section meeting at the National Institute of Arthritis and Musculoskeletal and Skin (NIAMS) institute, part of the National Institutes of Health, held on June 7-9, 2015, in Dallas, Texas.
- **Salah-uddin Ahmed** served as a reviewer for the journals: Toxicology and Applied Pharmacology, Clinical Medicine Insights: Arthritis and Musculoskeletal Disorders, and Functional Foods in Health and Diseases.
- **Salah-uddin Ahmed** served as chair of the Graduate Admissions Committee for the WSU College of Pharmacy, in Spokane, Wash.
- **Sergei Tolmachev** was reappointed to serve a third term on the editorial board of the Japanese Journal of Health Physics (JJHP) from August 1, 2015 to July 31, 2017.
- **Philip Lazarus** served as an external dissertation reviewer for Gabriela Galicia-Vazquez at the McGill University College of Medicine’s Department of Biochemistry on July 6, 2015. Thesis title: Modulation of translation initiation by eIF4A
- Experimental and Systems Pharmacology Assistant Professor **Shobhan Gaddameedhi** was selected to serve as chair of the symposium and will also present, “Chronopharmacology in cancer: does time really matter?” at the American Society for Pharmacology and Experimental Therapeutics (ASPET) Annual Meeting at Experimental Biology 2016.

Awards

- **Salah-uddin Ahmed** received an award from Illumina, Inc., a health sciences technology company that builds genome sequencers, for a proposal to identify novel genes involved in the pathogenesis of rheumatoid arthritis. The project was conducted through the Next-Generation Sequencing service run by the Genomics Core at WSU Spokane. The award was part of a WSU research proposal competition sponsored by Illumina to promote the use of WSU’s new genome sequencing facility by covering the cost of reagents and consumables for the accepted sequencing project.



STUDENT ACHIEVEMENT

Doctor of Philosophy (Ph.D.) students

- **Faya Zhang**, pharmaceutical sciences (Meadows lab), with faculty co-authors **Gary Meadows**, **Hui Zhang** and one other published, “Chronic alcohol consumption inhibits melanoma growth but decreases the survival of mice immunized with tumor cell lysate and boosted with a-galactosylceramide,” in the June issue of the journal International Immunopharmacology.

Doctor of Pharmacy (Pharm.D.) students

- **James Leonard**, with faculty co-authors **Terri Levien**, **Danial Baker** and one other published, “Ombitasvir/ Paritaprevir/Ritonavir and Dasabuvir,” in the May 2015 Hospital pharmacy (50(5):396-412. DOI:10.1310/hpj5005-396). [read more](#)
- **Brandon Adam** received the Kappa Psi Pharmaceutical Fraternity’s Grant Council Scholarship Key, which is awarded annually to those who graduate with first honors or who stand highest in their entire class of graduates.

JOBS

- [Clinical Assistant/Associate Professor](#)
Department of Pharmacotherapy, Yakima, Wash.

Coming Events

- August 21, 2015
The College of Pharmacy will host a white coat ceremony for the incoming class of 2019 at the Martin Woldson Theater at the Fox in Spokane, Wash.
- August 27, 2015
The College of Pharmacy will host a white coat ceremony for the incoming class of 2019 at Butler-Haney Hall on the Pacific Northwest University of Health Sciences campus in Yakima, Wash.



College of Pharmacy

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